10/657,736

IN THE SPECIFICATION

At page 3, line 7, please replace the paragraph with the following:

alleviated by the several methods and apparatus of the present invention for a system and method for converting an analog voltage signal to a digital representation at high speeds, known as an analog to digital converter (A/D converter). The invention teaches an N-bit A/D converter, made by N superconducting, preferably HTC, transmission lines. The N lines are arranged adjacently and in parallel with each other. On each line 2^{N-1} JJs are imbedded embedded in series. The JJs form a matrix over the configuration of the N superconducting transmission lines in such a manner that across the lines the JJs give N digit binary numbers, while in the length direction these N digit binary numbers fall in numerical order. A scanning electron beam is made to impinge on this arrangement. The beam is scanned across the lines at a high frequency, while it is deflected by the applied voltage signal along the direction of the lines. The beam generates a voltage step on any one of the N lines on condition of hitting any one of the JJs. In this manner upon each cross-scanning of the beam, an N-bit step voltage pattern is generated on the lines. This pattern is the direct digital readout of the input voltage signal.—

At page 7, line 8, please replace the paragraph with the following:

In Fig. 4, a general A/D converter 40 for N bits is illustrated. Here, of course, N transmission lines 42a, 42b, 42c... 42_{N-1} are needed. The rows repeat at a period p, the length of the JJ's, which is also the length of a unit of void, the shortest portion of the line without a JJ. The total length of each transmission line is $L = p2^N$. This relationship clearly shows that if L is maintained constant, as the value of p decreases, the number of bits increases, thus allowing for a wider the analog bandwidth. The analog bandwidth is limited by the propagation delay T of the signal in the transmission line 42, which is related to the length of the line. The bandwidth of the A/D converter 40 may be expressed by: BW = 1/2T. =